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ED1 and ED2 POSITIVE CELLS IN RAT UVEAL TISSUES FOLLOWING CORNEAL TRANSPLANTATION AND IMMUNOSUPPRESSIVE THERAPY

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Purpose: ED1+ (macrophages, monocytes and dendritic cells) and ED2+ cells (macrophages only) appear to have a role in corneal rejection following penetrating keratoplasty in the rat. In the following presentation the distribution of ED1 and ED2 positive cells in normal uveal tissues of Lewis rats, the influence of corneal transplantation and the effect of Cyclosporin A (CsA) upon both types of cells was examined.

Methods: 66 female Lewis rats were divided into following groups: (I) operated, untreated; (II) operated, CsA treated (10mg/kg i.m.); (III) unoperated, untreated; (IV) unoperated, CsA treated (10mg/kg i.m.). The animals in group (I) and (II) received corneal buttons from Lewis-Brown Norway rats, who differ completely for mayor histocompatability complex. From our previous studies the rejection time of group (I) is 13 days, of group (II) 16 days. Animals of group (I) and (II) were killed on the 5th, 9th and 13th postoperative day, of group (II) also on day 16. Both operated and partner eye were enucleated and immediately fixed in 100% alcohol. The iris, ciliary body and choroid were excised as a whole or flat mount and the number and distribution of ED1 and ED2 positive cells were observed using APAAP immunhistochemistry.

Results: In the normal iris (III) 400 ED1+ cells/mm² and 400 ED2+ cells/mm² could be found. While the number of ED1+ cells in the iris increased 3 times in value following keratoplasty, the number of ED2+ cells remained stable. The number of uveal ED2+ cells did not increase in either the operated or in the partner eye. Although systemic treatment with cyclosporin A resulted in a clinically significant delay in the corneal rejection progress, it did not effect the ED1+ and ED2+ cells.

Conclusion: Penetrating keratoplasty results in an increase of ED1+ cells in the iris of the operated eye. CsA treatment does not appear to significantly effect this cell population following penetrating keratoplasty. Uveal ED2+ cells were not influenced by corneal transplantation and CsA treatment.

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STROMAL CALCIFICATION AFTER PENETRATING KERATOPLASTY: A CASE HISTORY WITH ELECTRON MICROSCOPY and X-RAY MICROANALYSIS

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Introduction:In a patient with pre-existing glaucoma and stromal keratitic scars, penetrating keratoplasty was performed for endothelial decompensation after cataract extraction. Three months later, after healing of a persistent epithelial defect, a white stromal deposition developed centrally in the donor cornea. Cultures and smears for bacteriae and fungi were negative. Five months after the initial penetrating keratoplasty, a regraft was performed. The removed button was used for identification of the opacification.

Methods: The corneal button was fixed in a cacodylate buffered glutaraldehyde/paraformaldehyde solution and routinely processed for electron microscopy and X-ray microanalysis.

Results: By electron microscopy, the corneal epithelial cells appeared normal. Bowman's membrane was largely absent. In the anterior 2/3 of the corneal stroma, large depositions of electron-dense material were seen, consisting mainly of needlelike cristals. Local stromal necrosis with an accumulation of probably necrotic macrophages and leucocytes was observed. X-ray microanalysis revealed that the crystals had large phosphorus and calcium peaks.

Conclusion: The opacification was accompanied by the deposition of calcium phosphate crystals. A relation with the combined medication of local steroids (dexamethasone-phosphate) and anti-glaucomatous drugs (timolol) has previously been described. Our patient used both of these drugs. The precise causative mechanism of the calcium phosphate deposition in the corneal stroma, however, remains unknown.

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TITLE: RECURRENT BILATERAL KERATOCONUS AFTER CORNEAL TRANSPLANTATION

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ABSTRACT:

Purpose:
Keratoconus is a progressive, non inflammatory corneal ectasia, with a still unrecognized pathogenesis. It is a bilateral disorder in almost cases (90%).Advanced keratoconus, which cannot be treated with contact lenses, requires a surgical procedure such as epikeratophakia, or penetrating keratoplasty. Recurrence of keratoconus following penetrating keratoplasty has been previously reported.

Methods:
We report the case of a recurrent keratoconus in patient's both eyes, 11 years after corneal transplantation. A new corneal graft performed in one of them.

Results:
The recurrence is confirmed by histopathologic examination.

Conculsion:
This bilateral recurrence suggest that the keratoconus developes from host tissue, assisted by environmental factors and individual predisposition.

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MORPHOLOGIC INVESTIGATION OF RABBIT CORNEA WITH UNREJECTED INTRACORNEAL ALUMINIUM-OXIDE CERAMIC IMPLANT

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Purpose. The aim of the present study is establishment of morphologic changes of cornea with intrastromal intracorneal aluminium-oxide ceramic implant with the purpose of manufacturing supportive part of keratoprosthesis.

Methods. The experimental study was based on 36 New Zealand albino rabbits, with one eye tested. 36 implants with round, disc-like form , basic curve radius 7.7 mm, thickness 0.2-0.3 mm, diameter 3 mm, a central hole (diameter 1.2 mm) were implanted. We analyse only 24 eyes without macroscopic clinical signs of rejection. Enucleation was performed at the following terms: I group (8 eyes)- 3 to 7 day, II group (8 eyes)- 21 to 28 day; III group (8 eyes) - 75-90 day. The eyes were fixed in 10% neutral formalin solution. The ceramic were separated from the corneas. Paraffin histologic examinations was performed using hematoxylin - eosin.

Results. The examined corneas from I group showed in the implant's zone epithelium - 1-5 layers, desquamated in some cases, filling with plasma of the anterior corneal layers. II group - the epithelium over the implant is 1-4 layers, and in some cases a hyperplasia of the epithelium layers, in the zone over the implant's hole and around the implant was notified. The anterior corneal layers are more dense. In the zone, containig the implant, vascularisation was observed. The anterior and the posterior cornea, in the zone of the implant hole, are connected with growing granulation tissue. The corneal layers, contacting the implant, are not smooth. III group - the number of the epithelium layers, the density of the anterior cornea is similar to that of II group. The vascularisation was more pronounced. There is central fibrous bridge in the zone of the implant's hole. The contact surface was not smooth.

Conclusions. The local morphologic changes of the cornea are result of the disturbance of the normal flow of water and nutricnts mainly to the part of the cornea in front of the implant. In this case the fenestrations of the intracorneal implants are important for the survival of the implant. The local reactive changes, presented as vascularisation and growth of vascular tissue in the central "bridge" demonstrate acceptance of the implant.